

Discussion Topics with Mine for Future Coal Handling Facility

1. Permitting Implications to Coyote Station
 - The sum of all particulate matter emission increases from new and modified activities located at Coyote Station must stay under the PSD significance threshold of 25 tons PM, 15 tons PM₁₀, and 10 tons PM_{2.5}
 - Coyote Station will need to receive a Title V air quality permit amendment to approve the new activities.
 - i. Need to receive permit prior to beginning construction (includes prior to installing foundations)
 - New coal handling will need to comply with 40 CFR Part 60 Subpart Y - Standards of Performance for Coal Preparation and Processing Plants
2. Haul Road (Reference: Slide 2 of Powerpoint Presentation)
 - OTP to request determination from the Department of Health whether or not the haul road fugitive emissions will count towards the PSD significance threshold
 - If OTP has to count the haul road emissions, we will need to work hard to minimize the road length on Coyote property and have a plan to aggressively limit fugitive emissions.
 - i. This would be a large potential source of fugitives
 - ii. Silt content of road plays a big factor in the emissions calculation. Able to account for in design of road base?
 - iii. If Kress trucks are not used, plan on paving the road
 - According to EPA, roadways associated with surface mining activities will need to control fugitive emissions per the Surface Mining Control and Reclamation Act.
 - i. What fugitive haul road measures has North American taken elsewhere?
3. Coal Handling Facility (Reference: Slides 16-18 of .pdf)
 - a. Truck Unloading
 - Please describe unloading process
 - i. Does the coal drop into a complete enclosure?
 - ii. Unloading subject to a Subpart Y 10% opacity limit – use best demonstrated technology, such as fogging systems, passive enclosure, or mechanical vent to meet. Mine dealt with in past?
 - iii. Any grinding or crushing?
 - iv. Any pictures of similarly designed facilities?
 - b. Stockpile Area
 - This is a concern – any way to eliminate this on Coyote Station property?
 - i. Large source of fugitive emissions
 - ii. What is the purpose of this stockpile so close to Coyote Station with already having the existing coal pile?
 - iii. How active will this pile be? What equipment will be used on pile? How big will pile be (would need to know exposed surface area)?
 - iv. Subpart Y requirements for new open storage piles: Must submit to EPA or state a fugitive dust plan. Use one or more of following control measures: locating inside a partial enclosure, installing and operating a water spray or fogging system, applying appropriate chemical dust suppression agents, use of a wind barrier, compaction, or use of a vegetative cover.

- c. Coal Conveyor
 - o Confirm this will be enclosed?
 - o Appears to be a short open area – why?
- d. Rail loadout and transfer system
 - o What does this involve?
 - o When would we know if this needs to be included?
- e. Other
 - o Will there be any new dust collectors?
 - i. Would be subject to a PM limit of 0.010 gr/dscf
 - ii. Best to avoid these if possible
 - o Any changes to existing Coyote Station coal handling equipment?
 - i. What modifications are needed to belt into live storage?

4. Timeline Related Questions (Reference: Slide 34 of .pdf)

- o Will the mine need an air permit from the DOH?
 - i. If need to make any fugitive emission calculations, we will want to be consistent
 - ii. Be careful in descriptions to make sure we permit as separate facilities
- o When will mine begin applying for permits?
- o When will design and equipment selection for coal handling facility begin?
- o When will construction on coal handling facility begin?
 - i. Need to obtain permit prior to construction on Coyote property. Assume 6 months to obtain.

File Maintenance - Upgrade Heat Road Emission: From AP-42, Section 13.2.2.2 (1/98)			
E = 46/137 (AP-42)			
	PM ₁₀	PM _{2.5}	PM ₁₀
R = constant	1.00	0.11	Taken from Table 13.2.2.2 in AP-42
R = constant	0.99	0.99	Taken from Table 13.2.2.2 in AP-42
R = constant	0.45	0.45	Taken from Table 13.2.2.2 in AP-42
R = surface material silt content (%)	3.2	3.2	AP-42 Table 13.2.2.2, 1108, coal fired power plant used as specified
Mission heavy grossed period	400.00	400.00	Need to verify
Length of Road Segment	0.08	0.08	0.08 feet
Weight of Vehicle (W _v)	33.00	33.00	lbs
Distance Traveled per Hour	1.84	1.84	0.0104
Emission Factor	0.96	0.19	By VMT
Coal Heat Device Annual Emission	3.71	0.77	By

File Maintenance - Building of Coal From AP-42, Section 13.5 (1/98)			
PM ₁₀ E = [(8.670) * L] / (M * A) * scaling factor			
PM _{2.5} E = [(8.670) * L] / (M * A) * scaling factor			
	PM ₁₀	PM _{2.5}	Taken from Table 13.5.3 in AP-42
S = surface material silt content (%)	9.60	8.60	Assume 87% fines
M = annual maintenance constant	3.00	25.00	Assume 87% fines
A = annual maintenance constant	0.75	0.62	Assume 87% fines
Dwelling Factor	2.68	0.11	By
Dwelling Emission	17.81	0.59	By

6.9768602

Coal Pile Wind Emission - Major Heat AD001			
E = R * A			
R = 1 * L * [(8.670) * L] / (M * A) * scaling factor			
	PM ₁₀	PM _{2.5}	From Table 2 of document
S = surface material silt content (%)	4.00	4.00	Assume 87% fines
M = annual maintenance constant	3.00	25.00	Assume 87% fines
A = annual maintenance constant	0.75	0.62	Assume 87% fines
Weight Factor	25.00	25.00	Assume 87% fines
Surface Area	3.00	3.00	Assume 87% fines
E	1.11	0.48	Assume 87% fines
Annual Emission	6.05	3.47	By

Coyote Station
Belt Coal Conveyor

From AP-42, Section 13.2.4 (1.166) - Aggregate Handling & Storage Piles

$E = 0.0021(U)^{1.4}$ (M/2) ^{1.4}	PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
U = mean wind speed (mph) ¹			11.8	
M = minimum material moisture content (%) ²		34.0		
k =	0.74	0.151	0.151	0.053
E (lb/day) ³	1.27E-04	5.77E-05	2.995E-09	8.74E-06
Maximum Material Load ⁴ (tpy)				
Uncontrolled Maximum Emissions (tpy)	0.19	0.036		0.01
Control Efficiency (DA Exhaust) ⁵		75%		
Controlled Maximum Emissions (tpy)	0.05	0.02		0.00

¹ 30 yr Binmark average from: www.epa.gov/eis/airquality/airquality/airquality.html

² The minimum monthly average moisture content delivered to Coyote since 2010 was 34.1% on February 2011.

³ Based on 8,740 tons per year, at Coyote's minimum rated belt height of 4.4ft³ multiplied, with a unit load content of 6,000 lbs/ft³.

⁴ Assumed to be equivalent to present stockpile.

From WCAP fugitive dust Handbook Section 9.3: Alternative Methodology for Worst Estimation of Active Storage Piles

$E = 1.7 k (01.5) [(363 - p) / 245] (FIS)$	TSP	PM ₁₀	PM _{2.5}
k = AP-42 Section 13.2.5 meteorologic particle size multiplier ¹	1	0.5	0.075
s = silt content of material (weight %) ²	6.2		
F = % of time undisturbed wind speed is greater than 12 mph ³		50	
p = number of days per year with at least 0.01 inch of precip ⁴		90	
E (lb/day) (area of surface) ⁵	27.4	13.7	2.1
Surface Area exposed (acre) ⁶		0.13	
Control Efficiency (DA Exhaust) ⁷		75%	
E (ton/year) ⁸	0.16	0.08	0.01

¹ Mean silt content for Western Surface Coal Mining from Table 4.1 of WCAP Fugitive Dust Handbook, Modules AP-42 Table 13.2.4-1

² The 30 yr Binmark average is 10.8 mph (from www.epa.gov/eis/airquality/airquality/airquality.html), so it is conservative to 30% value of wind speeds given in Figure 13.2.1.2

³ From AP-42 Figure 13.2.1.2

⁴ Based on an estimated conveyor length of 1,000 feet and a design width of 4 feet (500 square feet)

⁵ From Table 9.4 of WCAP Fugitive Dust Handbook for 3-sided enclosures, which will be more similar to Coyote's planned conveyor design.

⁶ This is a conservative estimate that assumes the conveyor would be active 365 days per year.

Unpaved Haul Road Emission Equations, From AP-42 Section 13.2.2 (11/86)				
Emission Factor, $Ext = E \cdot (k \cdot (s/12)^a \cdot (W/3)^b) \cdot [(365 - P)/365]$				
Where:	PM_{10}	$PM_{2.5}$	PM_{10}	
k = constant	1.5	0.15	4.9	
a = constant	0.9	0.9	0.70	Table 13.2.2.2 in AP-42
b = constant	0.45	0.45	0.45	Table 13.2.2.2 in AP-42
s = Silt content (%)	western surface coal mining plant road. Asphalt aggregate 1.0 - 8.0 per Paul textbook (Weighted Average)			
W = mean vehicle weight (tons)	234.50			
P = # days/yr with at least 0.01 in precip	90.00			
Total length traveled (miles/yr)	671499.55			
E = (lb/VMT) w/o precip correction	3.97	0.40	16.15	
Ext = (lb/VMT) w/ precip correction	2.98	0.30	12.16	
Emissions = Ext \cdot total \cdot YMD/yr = tpy	100.76	10.08	410.02	

Significance Thresholds 15 10 25

Control needed 85% 1% 94%

Precipitation Days greater than .01 inch: 90

Figure 13.2.1-2

Correction factor for precipitation: 0.838

Material	Projected Annual (Tons)	Avg. Vehicle Capacity	Trucks per Year	
			Plant Total	This Project
Coal to coyote	2995920	200	14,980	14,980

Description	Truck Type	Truck Weight		Road Length (m)	Trucks per Year This Project	Distance per Year (meters)	Distance per Year (miles)	Average Vehicle Weight
		Loaded tons	Unloaded tons					
Coal to coyote	Kress Haul Truck	334.5	154.5	7,242.00	14,980	108,485,160	67,410	23.5

4.5 miles round trip

Paved Haul Road Emission Equations, From AP-42 Section 13.2.1 (1/11)	
Emission Factor, $E = [k \cdot (sL)^{0.91} \cdot (W)^{1.02}] \cdot (1-PAN)$	
Where:	
k = constant (PM ₁₀)	0.0022 From Table 13.2.1-1 in AP-42
k = constant (PM _{2.5})	0.00054 From Table 13.2.1-1 in AP-42
k = constant (PM ₁₀)	0.011 From Table 13.2.1-1 in AP-42
sL = Silt loading (g/m ³)	Table 13.2.1-2, ubiquitous baseline 0.6 for <300 trucks per day
W = mean vehicle weight (tons)	27.50 tons (Weighted Average)
Total length traveled	539,262.9 miles/yr
E _{PM10}	0.1905 lb PM ₁₀ /VMT
E _{PM10}	0.0381 lb PM ₁₀ /VMT
E _{PM2.5}	0.0094 lb PM _{2.5} /VMT
Emissions = E _{load} × VMT/yr = tpy	
PM ₁₀	51.38 tpy
PM ₁₀	10.28 tpy
PM _{2.5}	2.52 tpy

Unpaved Haul Road Emission Equations, From AP-42 Section 13.2.2 (11/06)	
Emission Factor, $E_{ext} = E [k \cdot (sL)^{0.91} \cdot (W)^{1.02}] \cdot (1-PAN)$	
Where:	
k = constant	1.5
a = constant	0.9
b = constant	0.45
s = Silt content (%)	8.3
W = mean vehicle weight (tons)	27.50
P = # days/yr with at least 0.01 in precip	100.00
Total length traveled (miles/yr)	539,262.93
E = (lb/VMT) w/o precip correction	2.92
E _{ext} = (lb/VMT) w/ precip correction	2.12
Emissions = E _{ext} × VMT/yr = tpy	571.11
Emissions	571.11

Significance Thresholds 15 10 25
 Control needed 97% 82% 99%
 Precipitation Days greater than .01 inch: 90 Figure 13.2.1-2
 Correction factor for precipitation: 0.938

Material	Projected Annual (Tons)	Avg. Vehicle Capacity	Trucks per Year	
			Plant Total	This Project
Coal to coyote	2995920	25	119,837	119,837

Description	Truck Type	Truck Weight		Road Length (m)	Trucks per Year This Project	Distance per Year (meters)	Distance per Year (miles)	Average Vehicle Weight
		Loaded tons	Unloaded tons					
Coal to coyote	Semi	40.0	15	7,242.00	119,837	867,859,554	539,263	28

4.5 miles round trip

Unpaved Haul Road Emission Equations, From AP-42 Section 13.2.2 (11/96)

$$\text{Emission Factor, Ext} = E [k \cdot (s/12)^a \cdot (W/3)^b] \cdot [(365 - P)/365]$$

Where:

	PM ₁₀	PM _{2.5}	PM _{2.5}
k = constant	1.5	0.15	4.9
a = constant	0.9	0.9	0.70
b = constant	0.45	0.45	0.45
s = Silt content (%)	6.4		
W = mean vehicle weight (tons)	40.21		
P = # days/yr with at least 0.01 in precip	90.00		
Total length traveled (miles/yr)	21096.37		
E = (lb/VMT) w/o precip correction	2.74	0.27	10.15
Ext = (lb/VMT) w/ precip correction	2.06	0.21	7.65
Emissions = Ext _{aver} × VMT/yr = tpy	21.77	2.18	80.65

Significance Thresholds 15 10 25

Control needed 31% -3.59% 69%

Precipitation Days greater than .01 inch: 90 Figure 13.2.1-2

Correction factor for precipitation: 0.938

Material	2011(Tons)	Avg. Vehicle Capacity	Trucks per Year					
			Plant Total	This Project				
FGD Product to Blue Pit	184380	28	6,585	6,585				
Boiler Slag to Blue Pit	17542	40	439	439				
Boiler Slag to Purple Pit - First route	23,830.00	40	596	596				
Boiler Slag to Purple Pit - 2nd half route to Hvc	23,830.00	40	596	596				
Description	Truck Type	Truck Weight		Road Length (m)	Trucks per Year This Project	Distance per Year (meters)	Distance per Year (miles)	Average Vehicle Weight
		Loaded tons	Unloaded tons					
FGD Product to Blue Pit		53.4	25.4	4,654.41	6,585	30,649,487	19,045	39
Boiler Slag to Blue Pit		65.4	35.4	3,850.22	439	1,690,247	1,050	45

Table 1: Projected Particulate Matter Increase

	40 CFR 52.21 Significant Emission Rates (tons/yr)
PM ₁₀ ^{2.5}	25
PM ₁₀ ^{2.5}	15
PM _{2.5} ^{2.5}	10

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bc: Brad Zimmerman/
Coyote File: Air/Permits/Title V Permit
Bill Swanson
Brad Tollerson
PV/MT/B.4.4.C

December 10, 2014

Mr. Terry O'Clair, P.E.
Director, Division of Air Quality
North Dakota Department of Health
Gold Seal Center, 918 East Divide Ave
Bismarck, ND 58501-1947



Dear Mr. O'Clair:

SUBJECT: Coyote Station: Notice of Planned Construction of New Conveyor

The purpose of this letter is to inform your Department of plans to begin construction of a new coal conveyor at Coyote Station in mid-2015. This conveyor will deliver coal from a subsidiary of The North American Coal Corporation, for lignite coal supply to Coyote beginning May 2016. Coincident with the operation of the new conveyor, the operation of the existing conveyor that delivers coal from Dakota Westmoreland Corporation will be discontinued.

There will be no new point sources (i.e. mechanical vents) of emissions associated with the proposed conveyor, only minimal fugitive emissions of particulate matter. The new conveyor will be protected by a rounded cover that will extend approximately three-quarters over the conveyor belt, such that conveyor operation will be able to be observed by plant personnel on one side. Similar to the existing conveyor setup, the new conveyor will transfer coal into Coyote's enclosed live storage building using a passive enclosure containment system without any point sources of emissions. As detailed in the emissions calculation table on the next page, conservative fugitive estimates of annual emissions of PM10 and PM2.5 from the new conveyor are estimated to be less than 0.1 tons.

Based on these minimal emissions and the fact that there will be no new point source of emissions, Otter Tail does not believe that a permit to construct is required, nor should there be an impact on our existing Title V permit to operate. Otter Tail acknowledges that the new conveyor will be subject to the standards for coal conveying equipment set forth in 40 CFR Part 60 Subpart Y. This will include the opacity standard set forth in §60.254(b)(1), the performance testing requirements, procedures, and reports given by §60.255(b)(2), §60.257(a), and §60.258(c)-(d), and the general notification requirements in §60.7-8.

If you have any questions about this notice, please contact me at mthoma@otpc.com or at (218) 739-8526.

Sincerely,

A handwritten signature in black ink that reads "Mark Thoma".

Mark Thoma
Manager, Environmental Services

An Equal Opportunity Employer

